

Appln. No.: 10/606,606
Amendment Dated June 28, 2004
Reply to Office Action of March 26, 2004

MKPA-104US

Remarks/Arguments:

By this Office Action, the Examiner has rejected claims 1-5, 9-10, 14, 18, and 22 under 35 U.S.C. 102(b) as being clearly anticipated by the patent to Verdiell (US#6207950). Additionally, claims 1-4, 9-10, 14-15, 18, and 22-23 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the patent to Enochs et al. (US#4818056). Dependent claims 5-8, 11-13, 16-17, 19, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over one or more of the patents to Enochs et al., Verdiell, Bartur et al. (US#6652158), Panicker et al. (US#6623180), Uchida (US#5535296), and Lebby et al. (US#5228101). Because the Examiner has not stated any specific reason for rejecting or objecting to claims 20 and 21, Applicant assumes that these claims are subject to objection as being dependent from a rejected base claim but would be allowed if rewritten to be independent in form and to include the limitations of their base claims and any intervening claims. The rejections of claims 1-19 and 22-25 are traversed or overcome by the arguments and amendments presented herein.

In particular, none of the references either alone or in combination with other ones of the references discloses or suggests, "a substrate having an optical component mount aperture formed therein and a substantially planar fiber mount region adjacent to the optical component mount aperture, wherein the fiber mount region is configured to mount the optical fiber directly to the substrate." As required by amended claim 1, "a metallic fiber mount pad formed on the substantially planar fiber mount region the metallic fiber mount pad being configured to secure the optical fiber to the substrate with a metallic solder" as required by amended claim 2, the step of "designating a substantially planar fiber mount region on a surface of the ceramic housing adjacent to the optical component mount aperture for mounting an optical fiber directly on the ceramic housing," as required by claim 18 or "forming a metallic fiber mount pad on the substantially planar fiber mount region" as required by claim 21. Basis for these amendments may be found in paragraphs 0032 and 0038. Furthermore, none of the references discloses or suggests, either alone or in combination, "a high thermal conductivity base," or "a substrate having an optical component mount aperture formed therein and a substantially planar fiber mount region adjacent to the optical component mount aperture" as required by claim 9.

As to the rejection of claim 1, the Examiner asserts that "Verdiell discloses a fiber-coupled optical component housing 10... comprising a substrate (32,12) having an optical component (16,18) mounted on mount 32 having an aperture (unlabeled) formed therein... and

Appln. No.: 10/606,606
Amendment Dated June 28, 2004
Reply to Office Action of March 26, 2004

MKPA-104US

a substantially planar fiber mount 22 having a mounting region 30 (and/or 32) adjacent to the optical component mount aperture." The Applicant respectfully disagrees with this assertion.

With reference to Fig. 1 of Verdiell, package 10 includes substrate 12 and frame 32 where the "[a]ssembly comprises a substrate 12 with a positioning floor 14." The substrate is described as being formed from an "electrically isolating material ... such as alumina or beryllium oxide." (See col. 5, lines 21-23). Neither alumina nor beryllium oxide is "a high thermal conductivity base" as required by claim 9. Optical elements such as a laser diode 18 and lens 16 are mounted on floor 14 and/or platform 20, and the optical fiber (element 22) is mounted using flexure 24, which includes a bridge 30. (See col. 5, l. 16-37). In another embodiment of the invention, "the flexure 24 [is] attached directly to the substrate." (See col. 6, lines 12-14). If the frame 32 is not used, then the substrate does not have "an aperture formed therein." In either case, whether or not the frame is used, the substrate does not include a "fiber mount region ... configured to mount the optical fiber directly to the substrate" as required by claims 1 and 18 or "a metallic fiber mount pad formed on the ... fiber mount region ... to secure the optical fiber to the substrate with a metallic solder" as required by claims 2 and 21. All of the embodiments in Verdiell require the optical fiber 22 to be attached to the flexure 24 and then the flexure 24 to be attached to the substrate 12 or to the frame 32. The present invention represents an advantage over Verdiell because it eliminates the need for the flexure 24. Because these features of amended claims 1, 2, 9 and 18 and 21 are neither disclosed nor suggested by Verdiell, claims 1, 9 and 18 are not subject to rejection under 35 U.S.C. § 102(b) in view of Verdiell. Claims 3-5 depend from claim 2, claims 10 and 14 depend from claim 9 and claim 22 depends from claim 21. Accordingly, these claims are not subject to rejection under 35 U.S.C. § 102(b) in view of Verdiell for at least the same reasons as claims 1, 2, 9, 18 and 21.

As to the additional rejection of claims 1-4, 9, 10, 14, 15, 18, 22 and 23 as being anticipated by Enochs et al., the Examiner contends that "Enochs et al. disclose a fiber-coupled optical component housing, as indicated by the wall 14..., comprising a substrate 12 having an optical component mount aperture 16 formed therein, ..., and a substantially planar fiber mount region 22 adjacent to the optical component mount aperture." The Applicant respectfully disagrees with this interpretation of the prior art as it applies to the present invention as embodied in claim 1.

Appln. No.: 10/606,606
Amendment Dated June 28, 2004
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MKPA-104US

Rather, Enochs et al. disclose a mounting plate 11, with extending connector body 12, which is secured to wall 14. The extending connector body has a hollow cylindrical opening 16, in which ferrule 18 is positioned, the ferrule itself having a bore 20 within which an optical fiber 26 is positioned. This configuration may be considered to be a typical feed-through connection for optical fibers. Enochs et al. further disclose, however, that a "photo diode 30 is mounted to a substrate 40 which in turn is mounted to end surface 22 of ferrule 18 to thereby directly and rigidly mount the photo diode 30 to the connector body 12." (See col. 3, l. 6-49).

It can be seen that element 22 is not a fiber mount region, as cited in the Office Action; instead, it is the end face 22 of ferrule 18. Enochs et al. nowhere disclose or suggest that end face 22 of ferrule 18 is to be used as a "fiber mount region"; in fact, it would be illogical to do so, as optical fiber 26 is already contained within bore 20 of ferrule 18 and extends partially from (but is not mounted to) end face 22. Furthermore, element 16 is not an optical component mount aperture formed in the substrate, as recited in claims 1, 2, 9, 18 and 21; instead, it is cylinder opening 16 of the extending connector body 12. The optical component in Enochs et al. is represented by photo diode 30, which is "mounted to a substrate 40, which in turn is mounted to end surface 22 of ferrule 18" (col. 3, l. 45-48). It can be seen, therefore, that Enochs et al. nowhere disclose or suggest that cylinder opening 16 is to be used as an "optical component mount aperture"; in fact, it would be illogical to do so, as cylinder opening 16 is disclosed as wholly containing ferrule 18 (col. 3, l. 10-15).

Furthermore, Enochs et al. do not disclose or suggest "a substrate having an optical component mount aperture formed therein and a substantially planar fiber mount region adjacent to the optical component mount aperture, wherein the fiber mount region is configured to mount the optical fiber directly to the substrate." As required by amended claim 1, "a metallic fiber mount pad formed on the substantially planar fiber mount region the metallic fiber mount pad being configured to secure the optical fiber to the substrate with a metallic solder" as required by amended claim 2, the step of "designating a substantially planar fiber mount region on a surface of the ceramic housing adjacent to the optical component mount aperture for mounting an optical fiber directly on the ceramic housing," as required by claim 18 or "forming a metallic fiber mount pad on the substantially planar fiber mount region" as required by claim 21.

Appln. No.: 10/606,606
Amendment Dated June 28, 2004
Reply to Office Action of March 26, 2004

MKPA-104US

Accordingly, claims 1, 2, 9, 18 and 21 are not subject to rejection under 35 U.S.C. 102(b) as being unpatentable over Enochs et al. Claims 3 and 4 depend from claim 2 and are also not subject to rejection for at least the same reasons as claim 1, claims 10 and 15 depend from claim 9 and are not subject to rejection under 35 U.S.C. § 102(b) as being anticipated by Enochs et al. for at least the same reasons as claim 9, claims 22 and 23 depend from claim 21 and are not subject to rejection under 35 U.S.C. § 102(b) as being anticipated by Enochs et al. for at least the same reasons as claim 21.

Claims 6-8, 12, 13 and 19 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Verdiell and Bartur et al. With respect to claims 12 and 13, this ground for rejection is traversed. With regard to claims 6-8 and 19, this ground for rejection is overcome by the amendments to claims 2 and 18. In particular, neither Verdiell, Bartur et al. nor their combination disclose or suggest, "a metallic fiber mount pad formed on the substantially planar fiber mount region the metallic fiber mount pad being configured to secure the optical fiber to the substrate with a metallic solder" as required by amended claim 2, the step of "designating a substantially planar fiber mount region on a surface of the ceramic housing adjacent to the optical component mount aperture for mounting an optical fiber directly on the ceramic housing," as required by claim 18, or "a high thermal conductivity base," as required by claim 9. Verdiell is described above. The Bartur et al. patent concerns an optical networking unit that includes a plurality of optical components mounted on a substrate composed of a material transparent to radiation. (See abstract). Bartur et al. disclose that the optical fiber is mounted in an optical component holder 14 and that the optical component is mounted in optical component holder 16. The optical component holder 14 is not "a metallic fiber mount pad" as required by claim 2 and it is not configured to mount "the optical fiber directly on the ceramic housing" as required by claim 18. Furthermore, the substrate is described as being "a borosilicate glass (see col. 5, lines 38-40). Bartur et al. do not disclose or suggest a high thermal conductivity base, as required by claim 9. Because Bartur et al. do not provide this material that is missing from Verdiell, Claims 2, 9 and 18 are not subject to rejection under 35 U.S.C. § 103(a) in view of Verdiell and Bartur et al. and, thus, claims 6-8, which depend from claim 2; claims 12 and 13, which depend from claim 8; and claim 19, which depends from claim 18 can not be subject to rejection under 35 U.S.C. § 103(a) in view of Verdiell and Bartur et al.

Claims 11, 15 and 23 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Verdiell and Panicker et al. With regard to claims 11 and 15, this ground for rejection is

Page 10 of 13

Appln. No.: 10/606,606
Amendment Dated June 28, 2004
Reply to Office Action of March 26, 2004

MKPA-104US

traversed. With regard to claim 23, this ground for rejection is overcome by the amendment to claim 21. In particular, neither Verdiell, Panicker et al. nor their combination disclose or suggest, "a high thermal conductivity base," as required by claim 9 or the step of "forming a metallic fiber mount pad on the substantially planar fiber mount region" as required by claim 21. Verdiell is described above. Panicker et al. concerns an optical module having an enclosure with a hole in one side through which an optical fiber is directed. The module also includes a grooved silicon support that supports the fiber. (See col. 3, lines 52-64). Panicker et al. disclose only a substrate formed from alumina. (See col. 3, lines 1-3). Accordingly, Panicker et al. can not provide the material that is missing from Verdiell. Thus claim 9 and claims 11 and 15 which depend from it and claim 21 and claim 23 which depends from it are not subject to rejection under 35 U.S.C. § 103(a) as being obvious in view of Verdiell and Panicker et al.

Claims 16, 17, 24 and 25 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Verdiell and Uchida. With regard to claims 16 and 17, this ground for rejection is traversed. With regard to claims 24 and 25, this ground for rejection is overcome by the amendment to claim 21. In particular, neither Verdiell, Uchida nor their combination disclose or suggest, "a high thermal conductivity base," as required by claim 9 or the step of "forming a metallic fiber mount pad on the substantially planar fiber mount region" as required by claim 21. Verdiell is described above. Uchida concerns an integrated optoelectronic mounting assembly that has optical fibers supported between a grooved substrate and a clamping substrate. (See Abstract). As disclosed by Uchida, the only material disclosed for forming the structural components of the integrated optoelectronic coupler is alumina. (See col. 8, lines 14-18). Thus, Uchida does not provide the material that is missing from Verdiell. Accordingly, claim 9 and claims 16 and 17 which depend from it and claims 21 and claims 24 and 25 which depend from it are not subject to rejection under 35 U.S.C. § 103(a) in view of Verdiell and Uchida.

Claims 5-8, 12, 13, and 19 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Enochs et al. and Lebby et al. With regard to claims 5-8 and 19, this ground for rejection is overcome by the amendments to claims 2 and 18. With regard to claim 13, this ground for rejection is respectfully traversed. In particular, neither Enochs et al., Lebby et al. nor their combination disclose or suggest, "a substrate having an optical component mount aperture formed therein and a substantially planar fiber mount region adjacent to the optical component mount aperture," as required by claim 9, "a metallic fiber mount pad formed on the

Appln. No.: 10/606,606.
Amendment Dated June 28, 2004
Reply to Office Action of March 26, 2004

MKPA-104US

substantially planar fiber mount region the metallic fiber mount pad being configured to secure the optical fiber to the substrate with a metallic solder" as required by amended claim 2 or the step of "designating a substantially planar fiber mount region on a surface of the ceramic housing adjacent to the optical component mount aperture for mounting an optical fiber directly on the ceramic housing," as required by claim 18. Lebby et al. concerns an electrical to optical connector in which the optical components and optical fibers are mounted on separate substrates. (See Abstract). Thus, one substrate includes the optical components and the other substrate includes the optical fibers. Both the optical components and the optical fibers are attached to their respective substrates by "a curable material." (See col. 3, lines 65-67). Moreover, it is not obvious to combine the metal substrate of Lebby et al. with Enochs et al. because in Enochs et al., the optical component is attached to the substrate. Accordingly, if the metal substrate of Lebby et al. were used by Enochs et al., the optical component would short circuit. One skilled in the art having knowledge of Lebby et al. and Enochs et al. would use the ceramic substrate of Lebby et al. and not the metal substrate. Furthermore, Lebby et al. does not provide the elements that are missing from Enochs et al., as described above. Accordingly, claims 2, 9 and 18 are not subject to rejection under 35 U.S.C. § 103(a) in view of Enochs et al. and Lebby et al. and, therefore, claims 5-8, 12, 13, and 19 which variously depend from these claims are also not subject to rejection.

Claim 11 was rejected under 35 U.S.C. § 103(a) as being obvious in view of Enochs et al. and Panicker et al. As set forth above, neither Enochs et al., nor Panicker et al. discloses or suggests a high thermal conductivity base," as required by claim 9. Accordingly, claim 11, which depends from claim 9, is not subject to rejection under 35 U.S.C. § 103(a) as being obvious in view of Enochs et al. and Panicker et al.

Claims 16, 17, 24 and 25 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Enochs et al. and Uchida. As set forth above, neither Enochs et al., nor Uchida disclose or suggest, "a high thermal conductivity base," as required by claim 9, from which claims 16 and 17 depend nor the step of "forming a metallic fiber mount pad on the substantially planar fiber mount region" as required by claim 21 from which claims 24 and 25 depend. Accordingly, claims 16, 17, 24 and 25 are not subject to rejection under 35 U.S.C. § 103(a) in view of Enochs et al. and Uchida.


Appln. No.: 10/606,606
Amendment Dated June 28, 2004
Reply to Office Action of March 26, 2004

MKPA-104US

Because the Office Action provided no specific ground for rejecting claim 21, Applicant assumes that this claim would be in condition for allowance if amended to include the limitations of its base claim and any intervening claim. Claim 21 has been so amended and, thus, is in condition for allowance. In addition, the Office Action provided no specific grounds for rejecting claim 20. Because claim 18 is in condition for allowance, however, claim 20, which depends from it is also in condition for allowance.

In view of the foregoing remarks, Applicant requests that the Examiner reconsider and withdraw the rejection of claims 1-19 and 22-25.

Respectfully submitted,



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